

Name: _____

Date: _____

A2 CC 1: Final Review #2

This review sheet is not comprehensive. Please look over your old exams, homework assignments, and notes to prepare fully spending time specifically on questions that you struggled with on those assessments.

For Questions #1-2 perform the indicated operation(s) and express your answer in simplest form

1. $\frac{h-20}{h^2-16} + \frac{2}{h-4}$

2. $\frac{4}{x^2+4x-5} - \frac{3}{x^2-1}$

For Question #3 write the given expression as a single rational expression

3. $\frac{1 - \frac{1}{x}}{x - 2 + \frac{1}{x}}$

For Questions #4-7 solve for all values of x

4. $\frac{2x+3}{6} - \frac{2x+3}{3} = \frac{1}{2}$

5. $\frac{1}{x+3} - \frac{2}{3-x} = \frac{4}{x^2-9}$

6. Solve by **completing the square**: $2x^2 + 12x + 6 = 0$

7. Solve using the **Quadratic Formula**: $2x^2 = 7x - 4$

Questions #8-9 Multiple Choice

8. The roots of the equation $2x^2 + 3x + 2 = 0$ are

- a. Rational and Equal
- b. Imaginary
- c. Rational and Unequal
- d. Irrational and Unequal

9. A solution of the equation $2y^2 + 3y = -2$ is

- a. $-\frac{3}{4} + \frac{7}{4}i$
- b. $-\frac{3}{4} + \frac{i\sqrt{7}}{4}$
- c. $\frac{1}{2}$
- d. $-\frac{3}{4} + \frac{\sqrt{7}}{4}$

For #10, perform the indicated operation and express the answers in simplest form

10. $\frac{x^2 - 3x}{2x^2 + x - 6} \div \frac{x^2 - 5x + 6}{x^2 - 4}$

For #11-13, Factor completely

11. $3x^2 - 12$

12. $x^3 - x^2 - 6x$

13. $a^3 - 2a^2 + a - 2$

For #14-15, Simplify

14. $\frac{5x^2 - 15x}{27x - 3x^3}$

15. $\frac{y^2 + 3y - 28}{y^2 - 49}$

For #16-17 Identify the value(s) of the variable, if any, for which the fraction is undefined

16. $\frac{10}{x^2 - 25}$

17. $\frac{x^2 - 49}{2x^2 - 3x}$

For #18-19 Solve for all values of x.

18. $x - \sqrt{9 - 2x} = 3$

19. $2\sqrt{2x + 3} + x = 1$

20. Solve $\frac{x^2 - 10x + 25}{x - 3} \leq 0$ and express the solution in set builder and interval notation.

21. Solve $x^2 - 2x < 24$ and express the solution in set builder and interval notation

22. Divide $(x^5 - 5x^4 + 2x^2 - 5)$ by $(x^2 + 2x + 1)$ using Long Division

23. What is the remainder when $3x^{107} + 14x^{35} - 16x$ is divided by $(x - 1)$?

24. Determine if $(x + 3)$ is a factor of $f(x) = x^3 + x^2 - 5x + 3$

25. If $(x + 16)$ is a factor of $f(x)$ then what is one of the zeros?

26. If $f(x) = (x - 3)(2x - 1)(3 + x)$ then what are the roots?

27. Determine the equation of a cubic function whose zeros are -1, -2, and -3

28. What is the domain of $f(x) = \frac{1}{\sqrt{x-2}}$?

29. What is the domain of $f(x) = \frac{1}{x^2 - 16}$?

30. If $f(x) = 3x + 1$ and $g(x) = x^2 - 3$, what does $g(f(x))$ equal (in simplest form)?

31. The quadratic function $f(x)$ has a turning point at $(5, -8)$. If $g(x) = f(x + 7) - 3$, what are the coordinates of the turning point of $g(x)$?

32. Which set of ordered pairs does not represent a function?

- a) $\{(3, -2), (-2, 3), (4, -1), (-1, 4)\}$
- b) $\{(3, -2), (3, -4), (4, -1), (4, -3)\}$
- c) $\{(3, -2), (4, -3), (5, -4), (6, -5)\}$
- d) $\{(3, -2), (5, -2), (4, -2), (-1, -2)\}$

33. For the function $f(x)$ it is known that $(-12, 4)$ lies on the function. A second function, $g(x)$, is defined by the formula $g(x) = f(2x) - 3$. Describe the transformations that occur to the graph of $f(x)$ in order to produce the graph of $g(x)$. What point must lie on $g(x)$?

34. If y varies directly as x , and $x = 32$ when $y = 8$, what is y written as a function of x ?

a. $y = 8x + 32$

c. $y = 32x + 8$

b. $y = \frac{1}{4}x$

d. $y = 4x$

- 35.** The cost of travelling varies directly as the distance travelled. If it costs \$2,240 to fly from California to Hawaii (2,200 miles), how much would it cost to fly a distance of 4,000 miles from California to Peru?
- 36.** If p varies directly as q , and $p = 7$ when $q = 9$, find p when $q = 12$.
- 37.** Hector earned \$44.70 for working 6 hours. How much will he earn for working 8 hours?
- 38.** Solve the system of equations for x and y :
- $$\begin{aligned}2x + y &= 4 \\4x - 3y &= 13\end{aligned}$$
- 39.** Solve the following system of equations for x , y , and z :
- $$\begin{aligned}x + y - z &= 5 \\3x - 2y + z &= 8 \\2x + 2y - 2z &= 7\end{aligned}$$
- 40.** Joelle has a credit card that has a 19.2% annual interest rate compounded monthly. She owes a total balance of B dollars after m months. Assuming she makes no payments on her account, the table below illustrates the balance she owes after m months.

m	B
0	1000.00
10	1172.00
19	1352.00
36	1770.80
60	2591.90
69	2990.00
72	3135.80
73	3186.00

Over which interval of time is her average rate of change for the balance on her credit card account the greatest?

- a. month 10 to month 60
- b. month 19 to month 69
- c. month 36 to month 72
- d. month 60 to month 73

41. The distance needed to stop a car after applying the brakes varies directly with the square of the car's speed. The table below shows stopping distances for various speeds.

Speed (mph)	10	20	30	40	50	60	70
Distance (ft)	6.25	25	56.25	100	156.25	225	306.25

Determine the average rate of change in braking distance, in ft/mph, between one car traveling at 30 mph and one traveling at 70 mph.

42. Which of the following functions has a greater average rate of change on the interval $[-3, 4]$?

x	f(x)
-4	0.3125
-3	0.625
-2	1.25
-1	2.5
0	5
1	10
2	20
3	40
4	80
5	160
6	320

$$g(x) = 4x^3 - 5x^2 + 3$$

43. What is the vertex of the parabola $y = 2x^2 - 4x - 4$?

44. Given $x^2 + 10x - 8y + 33 = 0$, use the process of completing the square find:

- a. the coordinates of the vertex
- b. the coordinates of the focus

c. the equation of the directrix

45. Given a parabola with focus $(-2,1)$ and directrix $y = 3$.

d. Determine the vertex of the parabola

e. Write an equation for the parabola

46. The graph of an even function is always symmetrical with respect to what?

47. The graph of an odd function is always symmetrical with respect to what?

48. Determine if each of the following is even, odd, or neither by computing $f(-x)$

f. $f(x) = x^5 - x^3$

g. $f(x) = x^4 - x^2 - 6$

h. $f(x) = \frac{x^3 - x}{x^3 + x}$

49. What is $\sum_{x=6}^{10} (3x - 2)$ written in expanded form?

50. Write of the expanded form of $\sum_{n=1}^7 (-2)^{n-1}$ and then find the value of the sum.